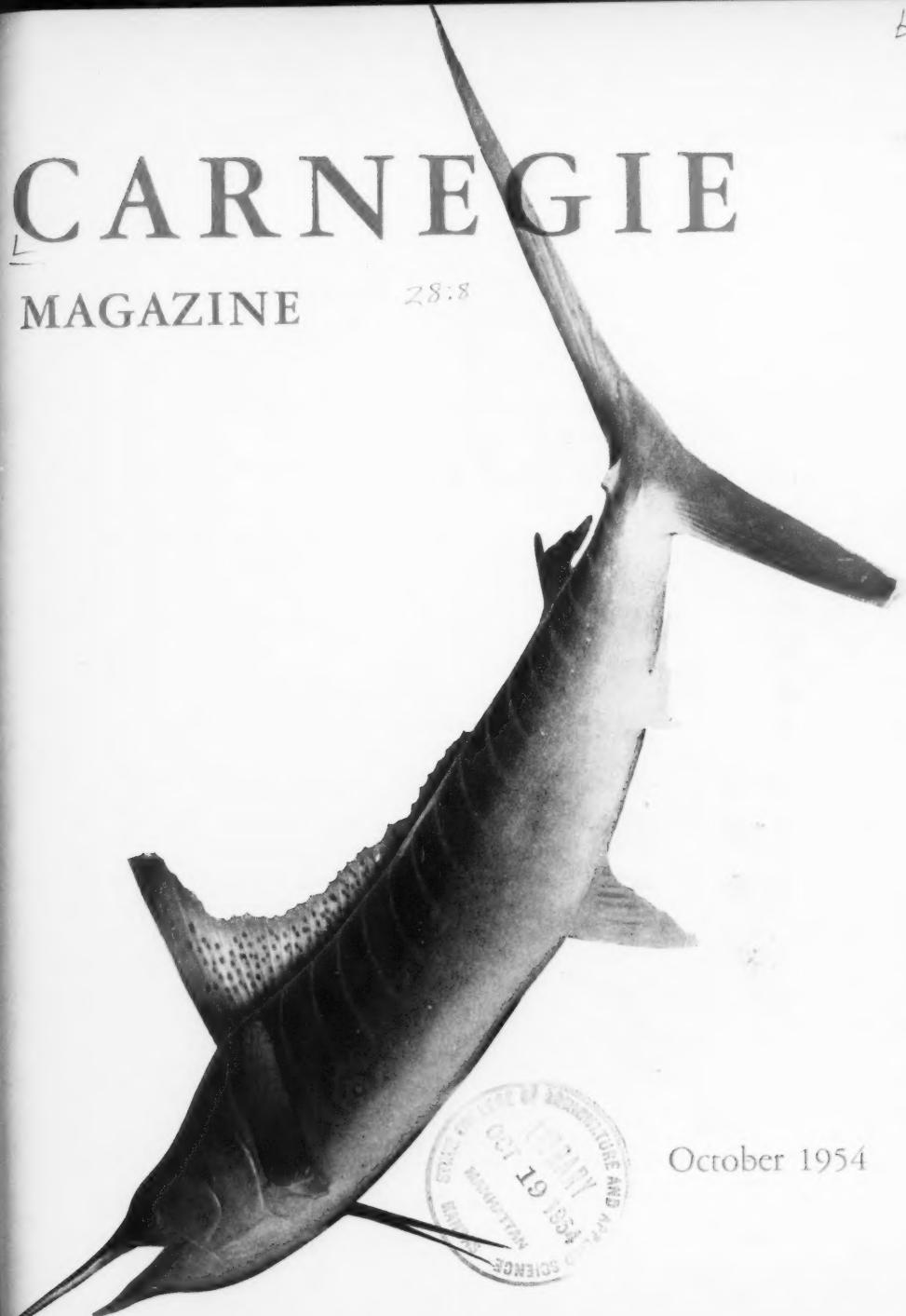


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CARNEGIE

MAGAZINE

28:8



October 1954



Etruscan burial urn, decorated with the reclining figure of a woman in the sleep of death. On exhibit at Carnegie Museum.



The Pre-Roman (Etruscan) Economy

Approximately 850-400 B.C.

This Etruscan burial urn is typical of the fine sculpture and stone-carving of the Pre-Roman period. In addition, many other crafts and industries were developed, including metal working, pottery making, weaving, jewelry making, quarrying and lumbering. And the extremely rich soil of the section made agriculture most important in the Etruscan economy.

A coinage and banking system did not come into use until after the height of Etruscan power. Originally, most trade was accomplished by primitive barter. Later in the period, lumps of copper were used as a medium of exchange.

In spite of their lack of a well-developed money system, the Etruscans were able to rise to power through the use of agricultural and industrial methods which were advanced for their time. Gradually, as trade developed with the Greeks, Carthaginians and other Mediterranean countries, the Etruscans came into possession of various types of Greek coins—which later became the basis for the Roman money system, upon which much of our modern money is patterned.

Thus, the use of standardized currencies and the development of banking practices came into being only as trade and commerce expanded. So it is today—our highly complex monetary and banking systems have come as a logical outgrowth of our modern financial and commercial needs.



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COVER

Of all the large salt-water fishes taken on rod and reel, the Marlin puts up the most spectacular fight, a fact that makes it one of the most popular big game fishes. The Striped Marlin shown on this month's cover will be displayed in the new Marine Hall. It was taken off Guaymas, Mexico, June 12, 1941, by the late J. Verner Scaife, Jr., and weighed 209 pounds.

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OCTOBER CALENDAR

FOUNDER-PATRONS DAY

Founder-Patrons Day will be celebrated at Carnegie Institute the evening of October 14 by a reception in the Hall of Sculpture, with music and refreshments.

The new Marine Hall and the exhibition of **GENRE PAINTING IN EUROPE** through four centuries will be opened that evening.

MARINE HALL

An unfinished but dramatic new exhibit opens this fall displaying big-game and coral-reef fishes that were assembled over many years by the late J. Verner Scaife, Jr., and have been presented to the Museum by Mrs. Scaife. The unusual installation is made possible through the generosity of Mr. Scaife's brother, Alan M. Scaife.

GENRE PAINTING IN EUROPE

The fall exhibition of the Department of Fine Arts is **PAINTINGS OF EVERYDAY LIFE: GENRE PAINTING IN EUROPE, 1500 TO 1900**. It will comprise eighty-six scenes of everyday life, from Breughel to Matisse and Picasso, lent from American collections, both private and public, and will continue through December 12.

The galleries will be open from 10:00 A.M. to 10:00 P.M., weekdays, 2:00 to 5:00 P.M., Sundays.

PERMANENT COLLECTION OF PAINTINGS

Fine Arts galleries A, B, and C on the second floor of the Institute have been redecorated, and the paintings grouped into "Old Masters," Modern European and American artists.

ONE-MAN EXHIBITION

Charles Le Clair's exhibit of oil paintings and drawings will inaugurate the Department of Fine Arts' series of one-man shows featuring local artists. It will be hung in Gallery K from October 3 through the 31st.

PORTRAIT MINIATURES

Nearly one hundred portrait miniatures encompassing four centuries, lent from the Heckert Collection of Heckmores Highlands, Butler County, may be seen in the Treasure Room on the balcony of the Hall of Sculpture through October 17.

TAPESTRIES

Ten Flemish tapestries woven by van der Borght depicting scenes from the Trojan War, lent by French & Company, two tapestries from the Worcester Art Museum, and five recent acquisitions to the Institute collection are hung in the Hall of Decorative Arts through October 17.

The three tapestries given by The Hearst Foundation, Inc., now hang in the Hall of Sculpture.

SOCIETY ILLUSTRATED LECTURE SERIES

Music Hall, 6:30 and 8:30 P.M.

*Admission only by membership and
October 26—AROUND THE HAWAIIAN ISLANDS*

Yew Char, photographer, tour-organizer, member of the Hawaiian legislature, and world traveler, will bring a most authentic and revealing picture of all the islands in the Hawaiian group.

November 2—Lecture omitted (Election Day)

LECTURES ON DECORATIVE ARTS

Herbert P. Weissberger, curator of decorative arts, will begin a series of one-hour illustrated talks in Lecture Hall on October 18 at 2:30 o'clock. Twelve Monday-afternoon dates will be included, and the series is open to members of Carnegie Institute Society.

In this connection Mr. Weissberger calls attention to the Art Division of Carnegie Library, to publications of the Victoria and Albert Museum available at the Art and Nature Shop, to the Pompeian Room, and to the decorative plaster casts in the Hall of Architecture.

October 18—THE ANCIENT NEAR EAST

Slides from Mesopotamia will be shown, but discussion will center on the culture of Egypt, emphasizing its architecture as a key to Egyptian furniture.

October 25—PRE-GREEK

The talk will deal with the Minoan and Mycenaean civilizations c. 1500 B.C., especially with wall painting, pottery, and metalwork.

November 1—GREECE

The Greek orders and ornament will be considered, but the topic will mainly concern furniture and vases of ancient Greece.

NATIONAL NEWSPAPER WEEK

An issue of John Peter Zenger's *The New York Weekly Journal*, lent by the *Pittsburgh Press*, will be on display this month in the Lending Department of Carnegie Library.

ORGAN RECITALS

Marshall Bidwell this month resumes his organ recitals each Sunday afternoon from 4:00 to 5:00 o'clock in Music Hall. These are sponsored by the Arbuckle-Jamison Foundation.

JUNIOR PATRONS OF ART

This class, for children of members of Carnegie Institute Society on payment of a small fee, will begin sessions on Saturday morning, October 23.

STORY HOUR

Story hour for pre-school children, on alternate Tuesday mornings at 10:30 o'clock, begins October 12 in the Boys and Girls Room of the Library.

PICTURES OF DAILY LIFE

An exhibition of four centuries of European genre painting

October 14—December 12

GORDON BAILEY WASHBURN

WE have defined *genre* in the introduction to the catalogue of the forthcoming exhibition as paintings of everyday life "wherein human figures, being treated as types, are anonymously depicted." The French word *genre*, meaning kind, sort, or variety, simply refers us to a kind of subject-matter in art. In the eighteenth century and earlier, *genre* included not only scenes and figures of common occurrence but also landscape, still life, portraiture, and other subjects not regarded as acceptable on the highest level of art. Since the mid-sixteenth century, with the founding of the first formal art academies, critics and other leaders of culture had established the idea that "history painting" alone was of primary value. "Histories," as they were called, were pictures whose themes were taken from history, the Scriptures, or other great poetic works. Their subject-matter, being itself inspirational, was supposed to lift the observer, with the supplementary aid of a practiced art, to the most sublime reaches of moral truth and beauty. Yet the urge to realism or naturalism, as well as the independence of spirit of individual artists, ever and again defied the rule of the academies on this point.

Already, before the year 1500 (which our exhibition takes as its point of departure), the urge to realism had been of strong recurrence in the history of Western art. The Greeks of the Hellenistic period had painted genre pictures, and medieval artists, in every medium, had incorporated scenes of everyday life into the fabric of a Christian iconography whose metaphysical thought denied, in es-



THE JOLLY TOPER

By FRANS HALS (Dutch, 1580?-1666)

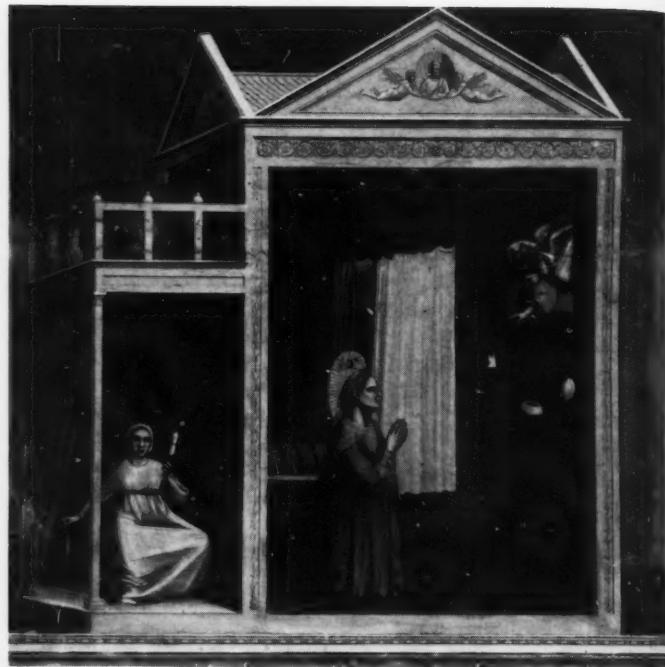
Lent by Mrs. William VanHorne, D.M.G.
Montreal, Canada

sence, the reality of the mortal life. Yet when temporal themes and a worldly realism demanded utterance, they too found a place in religious expression, as in the Books of Hours, in church carvings, and in the great fifteenth-century Gothic altarpieces of the Netherlands school by Robert Campin (The Master of Flémalle), the van Eycks, and Hugo van der Goes.

In Italy what we call "the Renaissance"—a reawakening of man's consciousness of his physical environment and his central role in the world—was naturally declared in realistic

terms. Among the first of these (here illustrated by Giotto's *Angel Appearing to Ste Anna*) are the frescoes that decorate the Arena Chapel in Padua, dating from the early fourteenth century. Instead of using the traditional gold background that had signified a mystical drama taking place in a nether world of the spirit, Giotto daringly offered the scene in a contemporary setting—a setting of actuality. Ste Anna is here shown as a real, three-dimensional woman, kneeling in her bed-chamber, which is equipped with all its chests, curtains, and other homely accessories. He painted the religious story, in other words, in an idiom that would later be spoken of as *genre*. Only the angel, as we here see it isolated from its setting, tells us that this is not a scene from everyday life.

The exploration of the visible world of actuality—its perspectives, its light effects, its densities and weights—became, as we know, a characteristic of Renaissance art, culminating in the early sixteenth century in the accomplished naturalism of Raphael and Leonardo. However, a sharp reaction took place about 1530 with a change in the social and political climate. Italian Mannerist painters rejected the images of actuality in favor of subjective ones, returning, though in different terms, to statements of a largely



THE TIDINGS TO ANNA OF THE CONCEPTION OF MARY
By Giotto di Bondone (Italian, 1266/76-1337) Arena Chapel, Padua

Alinari

spiritual or visionary character. A torment of the spirit shook the world, denying its physical realities. This led, with the founding of art academies, to a critical and analytical search for the fundamental basis of artistic truth and beauty, and resulted in rules for their attainment which eventually hardened into esthetic dogmas.

But all parts of Europe were not equally affected by this spiritual crisis and its developments. In the State of Venice, for instance, which was isolated from Hapsburg and French imperialism in the sixteenth century, naturalism was not so easily discarded as in the South. Its people and her artists, living more securely than elsewhere, continued and developed the fifteenth-century tradition which had seen the physical world

of reality as an extension and expression of the world of the spirit. Thus painters like Giorgione extended and developed the imagery of the Bellinis, and the following generation of painters, including Titian, Veronese, and Tintoretto, as well as the da Pontes (the Bassano family of artists), united within their great canvases both the world of material appearances and the insubstantial visions of the soul. Some, such as Dosso Dossi, Jacopo di Barbari, and the Bassani, even painted worldly scenes containing no direct references to religious thought. They painted straight landscapes with figures; they made, in fact, the first works of *genre* since the Greeks.

But *genre* was first developed as a cultural product, that is to say, as the characteristic expression of a national school, by the Netherlanders. Northern artists studied in Venice in the sixteenth century, catching the secular spirit of this art, and acquiring, as best each might, the craftsmanship of the North Italian painters. Their own heritage had already been established as a naturalistic one in the fifteenth century, so that masters like Hieronymus Bosch and Pieter Bruegel were more attracted by their own native taste for the particular than by that of the Italians for the general or the ideal. Both artists stressed the con-

temporaneity and actuality of a religious theme when they painted it, and the great Pieter Bruegel, before he died, dropped religious or moralistic themes in favor of straight peasant subjects or pure *genre*.

In the next century the Hollanders, having achieved religious freedom, national unity, and commercial prosperity, developed an entire national school of genre painters; artists who, whether or not they used religious or historical themes, painted their pictures in terms of everyday people and happenings. Without the traditional patronage either of Church or State, they were free to paint whatever they could sell to the burghers and other citizens of the United Provinces. These ready clients favored small pictures of daily life in Holland and filled their houses with them, although they paid as little as they might and were wholly unconcerned with the security of the artists. Only a few hundred



A SKATING PARTY (1796) BY GEORGE MORLAND (British, 1763-1804)
Lent by Mr. and Mrs. L. Gerald Firth, Pittsburgh

miles south, in France, most artists were still under the protection of the Catholic Church and of King Louis XIV, who protected and employed the best of them on a far higher level of living. This patronage, needless to say, was enjoyed at the expense of the artists' individual freedom.

As in any movement, a great diversity of talents appeared within the Dutch school. Many painters were satisfied merely to describe scenes and incidents, much as a reporter gives us his story. But there were other artists, of superior outlook and vision, who attempted to recreate the visible world in the humanistic terms of art by subjecting the order of nature to the different order of human thought and feeling. These were the great "little masters" of Holland: Vermeer, Rembrandt, Hals, Brouwer, Steen, and a few others whose superiority, now fully revealed with the passage of time, shows us that genre painting, however much it may have been deprecated in official circles of art, was not always to be so despised.

Even in authoritarian France, where the State dictated its terms to the artist, a few dissident men of genius painted works of a genre character that we now recognize as among the greatest works of the seventeenth century. We think at once of the Brothers Le Nain—particularly the immortal Louis—and of that profoundly moving religious artist, Georges de La Tour, who, like Rembrandt, created his spiritual images from ordinary country models without idealizing them as official fashion would have decreed.

There is a deeper significance than we recog-



THE CORRESPONDENT BY GERALD TER BORCH (Dutch, 1617-81)
Lent by David Bingham, Hartsdale, New York

nize to the long conflict between genre and history painting, which was fought out between state academies and individuals or national schools in the three and a half centuries between the mid-sixteenth and the twentieth. Nor does the word *genre* point clearly to a solution of it. It was never, as a matter of fact, a question of a choice of subject matter that ultimately determined whether a work of art was or was not a great one. Yet the painters of genre moved in the right direction since it was through their insistence on a wider range of picture-subjects that we have come to understand the essential insignificance of the subject itself as a basic index of values.

This does not mean that his choice of subject will not always be of importance to the artist; but rather that there are no preferable subjects and consequently no hierarchy of them that we must be expected to recognize. During this long period of time of which we speak, it was supposed that there was; it was believed that history painting alone was the suitable choice of a serious painter and that pictures of commonplace subjects must be recognized as having rank only on a much lower level. Yet what, it may fairly be asked, now brings us to this different conclusion? On what basis has opinion been reversed on this fundamental question of art?

The answer is a simple one, yet one which has depended upon a passage of time during which various artists of the highest genius may be seen to have performed their poetic function within the widest conceivable range of subject choice. Even as late as Monet and the Impressionists, and as Van Gogh and the Post-Impressionists (not to mention Soutine in our own century), protest was often focussed on the artist's choice of subject. Yet now, looking back from our mid-twentieth century point of vantage, we realize that enough evidence has finally been assembled to reach a clear conclusion.

In general terms, we see that the painters of genre include among their ranks many of the greatest artists of the last three and a half centuries, from Bruegel to Cézanne. We see that their subject-matter, ranging from peasants to prostitutes among ordinary people and from queens to merchants among the

ruling classes, embraces mankind in all its variety. We see that aside from subjects of moral or religious import, every kind of landscape, seascape, still life, portrait, conversation piece, battle picture, sporting theme, and subject from the realm of fancy or everyday life has tempted the brush of genius—and been given that permanence that can be attained only through the highest order of creative vision. We see, at long last, that genius, although it has often proven itself capable of regimentation, is also capable of choosing its own paths, its own themes, wherein it can speak both nobly and eloquently to its fellowmen.

The great record of the nineteenth century, as well as such brilliant artists as Watteau and Chardin in the eighteenth, shows us more convincingly than any argument how the artist may find, as did Velazquez, Vermeer, Rembrandt, Rubens, or La Tour, his own themes and his individual mode of dealing with them. When asked if he were not troubled to find sufficient subjects for his brush, Cézanne is remembered to have replied that this was no problem at all since he needed only to turn his head a little to have another subject for a picture. Like most great artists, he had come to realize that in the world of everyday reality every life movement is as important as every other. A good picture, he knew, was not a record, a paraphrase of appearances, but rather an independent creation, a new thing, inspired by contact with nature but not dictated by her. It was a human product, as an apple is the product of a tree, to paraphrase Arp.

Today, it is true, the question of a painter's choice of subject is no longer a concern in the sense in which we have been considering it. Most of the livelier talents of our time have dropped the picture-subject as inconsequential or even impedimental to their esthetic aims. Now, life movements are isolated and

In addition to this article Mr. Washburn, the director of fine arts at Carnegie Institute, has written a comprehensive introduction to the catalogue for the fall exhibition, *PAINTINGS OF EVERYDAY LIFE: GENRE PAINTING IN EUROPE, 1500-1900*. Containing 109 illustrations in black and white, one in color, this provides a much needed handbook on the subject and may be secured at the Art and Nature Shop of the Institute for \$1.75 plus postage.



THE POOR WOMAN OF THE VILLAGE BY GUSTAVE COURBET (French, 1819-77)

Lent by Major L. M. Bloomfield, QC, Montreal, Canada

generalized, being projected, as it were, without their references. The artists, departing from the realization that any picture-subject might be turned into good account by the imagination of a creative artist, have taken a further step. They wish to concern themselves only with the purer essences of visual communication, and to strain out the dross of all given forms. In lieu of a Vermeer we have a Mondrian; of a La Tour, we have a Léger. What is most curious, is the effect which our own experience with the moderns has had upon our view of the ancients. Looking, for instance, at the Adriaen van Ostade, we are first conscious of its formal organization, its marvelous spaces, and architectonic solids, and only secondarily aware of its picture-subject, its theme.

We see these old masters through renovated eyes, missing perhaps something of the sentimental appreciation of the picture-lover who was their contemporary, yet newly aware of

their formal values through the severity of our own ascetic disciplines and experiments. Perhaps this is one of the reasons that Vermeer is more greatly revered in the twentieth century than he was in the seventeenth. Moreover, if we have permitted ourselves to remain sufficiently flexible for it, we may also enjoy a double pleasure in the triumph of those great artists who not only have presented a world of visible actuality but have also transformed it by pictorial artifice into independent works of art.

BUTLER COUNTY MAMMALS

An attractive folder listing and describing the mammals of Butler County was prepared for the Butler Farm Show by Carnegie Museum at the direction of the Mellon National Bank and Trust Company Butler offices.

Copies may now be obtained without charge at the Butler offices of the Mellon Bank.

THE SEA COMES TO PITTSBURGH

VAUGHAN GARWOOD

EVER since people began to tell stories, the great epic of man's struggle for his soul has been dramatized most often and most memorably in a salt-water setting. Jonah, Ahab, Lord Jim, Captain Queeg—why is their common tragedy enacted time after time on the high seas? Popular-science writers will tell you we inherit a nostalgia for the earliest home of living things, though biologists say the origin of life is still a mystery. It may be that all men long for what no man can conquer. Whatever the reason, each generation in its turn looks oceanward with the same perennial mixture of horror and hankering.

This year the sea comes to Pittsburgh—a paradoxical city, with a busy port hundreds of miles from the coast. Beginning October 15, the marine world that makes up nearly three quarters of our globe will be yours to explore at Carnegie Museum in a series of vivid new displays now being installed on the first floor, near the dinosaurs. A key feature of the new hall will be the extensive collection of big-game and reef fishes assembled by the late J. Verner Scaife, Jr., and recently presented to the Museum by Mrs. Scaife. Installation of a marine exhibit of broad scope has been made possible through the generosity of Mr. Scaife's brother, Alan M. Scaife. Although the show as a whole is a long-range project requiring several years to complete, many of the most spectacular exhibits will be ready in time for the preview on Founder-Patrons Day, October 14.

When you speak of the sea, what do you mean? To most of us the word connotes an

Miss Garwood resigned as staff writer at Carnegie Museum last June to devote her full time to free-lance writing. The Museum is fortunate, however, in being able to enlist her services for special assignments.

endless expanse of water in motion, a vast undulating surface on which hollow shells of steel can be kept afloat with the aid of engines. But the surface is only one facet of a three-dimensional whole—the flat roof, if you like, of a labyrinthine palace whose floors lie in some places only a few feet lower than the roof, and in others descend to unlighted, unexplored abysses more than six miles deep. For thousands of years men have wondered what went on in these depths, whether living things could exist at the lower levels, and how they might differ from those above. The epochal voyage of the *Challenger*, which left England in 1872 equipped for deep dredging, initiated real exploration of the depths, an immense task which even today is far from completed. No wonder the sea is the great realm of legend, fantasy, and misapprehension!

As for the facts, let's begin with the simplest. Many a land-dweller is surprised to learn that the ocean harbors some forms of life too primitive to be classified with certainty as either plant or animal. These are minute, single-celled organisms closely resembling what scientists believe to have been the first living things the world ever knew. When a few plants and animals first upset the ancient pattern of nature by climbing out onto dry land, they left behind them a tremendous array of marine flora and fauna that outnumbered them then and still outnumbers their descendants today. There is more specialization on land because the species that undertook to live there have had to adapt themselves to heat, cold, crowding, isolation, and other hazards in a degree never demanded of creatures that remained in the relatively homogeneous world of the

ocean. But within the limitations of marine life is more variety than the human observer can encompass in many a lifetime—minute plants and gigantic kelps; animals that build cities out of their neighbors' and relatives' dead bodies; fish equipped with phosphorescent lights, like underwater jukeboxes; hosts of animals that resemble plants forming flower-like "gardens," strange protective associations and immunities, fish in unbelievable variety of form and color. Finally, great mammals like the mighty whale, whose ancestors learned to live on land, then "thought" better of it and reversed the evolutionary process in order to tool up again for life afloat. Scientists for generations have been studying this watery realm bit by bit. Our generation is beginning to assemble the bits and find out how it all hangs together.

As land-based creatures bustling about on the dry crust of our spinning planet, we forget that most of what we call the earth is really water. Whether life actually began there or not, the ocean has witnessed the longest span of evolution and continues to show most of the stages in that evolution today. The Museum's marine hall makes these facts unforgettable even to inlanders who have never seen the ocean. Entering the hall, the first thing you see is a series of diagrammatic exhibits showing the chief physical aspects of the marine world. These are brought into scale for landlubbers by contrast with things we all know from our own experience on terra firma. The diagrammatic treatment, an artist's device for condensing broad areas of knowledge into limited space, is continued in an adjoining panel that reveals the almost limitless variety of animal life in the ocean.

Thus far the Museum has been generalizing about life in the ocean. Now we come to specific marine environments reproduced from nature. Here is a Bay of Naples tide pool—

an exhibit dating from years ago, renovated and placed in a new setting. Over there is part of a New England coastline with plant and animal communities differentiated into various life zones. A kind of fugal variation on the ancient theme of "Eat or be eaten" is presented in a marine food chain, tracing the unbroken succession of prey and predator from microscopic water plants to big game fish—a chain that should end with man himself. A Gulf Stream exhibit features a central display showing the circulation of the Stream. On one side of this, representing a floating community of interdependent plants, is the sargassum weed that gave its name to the Sargasso Sea. On the other side is a glass model of the formidable Portuguese Man-of-War, representing an independent floating marine creature.

The coral reef, a dramatic demonstration of community life in the animal kingdom, is an important part of this marine-environment series. It will be exhibited in temporary form when the show opens, and completed whenever funds become available for a full-scale, detailed treatment. The big-game fish already mentioned will be one of the major attractions. A selection of scale models of fishing boats and an exhibition of sport fishing gear will be displayed.

No factual summary of the show's components can suggest the illusion, created by designers, artists, and preparators, of being actually below the surface of the sea, plumbing its secret depths and peering into the strange faces of its creatures. Much of this effect is due to a luminous ceiling made of a new material called Alsynite, donated jointly by the manufacturers and their local distributor, the Levco Corporation. The rest is the product of the special Carnegie Museum exhibit formula, a potent compound of scientific know-how, creative imagination, and plain hard work.

A PITTSBURGH LADY ON THE GRAND TOUR

MARY ROSWELL SCAIFE

PARIS, AUGUST 1878

TUESDAY morning we went to the Exposition, and staid all day. The morning we spent in Machinery Hall, and after dinner we went to see the Prince of Wales collection. I have read of such things, but never saw them before. Solid gold and silver dishes set with jewels, shawls and dresses embroidered with gold, lace made of gold thread.

At last we reached the Arc de Triomphe, mounted the 261 steps and were stepping out to have a fine view of Paris when it began to rain in torrents. We had to go down the first flight and wait. When we came up the sun was shining, and we saw a wonderful panorama spread out before us. While taking in this view of the city the balloon went up and came down twice, always filled with people.

Thursday is bath day with us. None of the French houses have bathrooms, but in about every two squares are houses where you can get any kind of a bath, hot, cold, vapor, Turkish, wrapped up in sheets, medical, and so on. You have to take your own soap and washrag. We pay ten cents for the room and water, two cents a towel, and four cents for pourboire, but we get an excellent bath although we have to wait our turn.

Seventy-five years ago the granddaughter of one of Pittsburgh's earliest industrialists, then in her thirty-fifth year, accompanied her mother and other members of her family on a grand tour of Europe. These excerpts from May Scaife's letters, written from France, Switzerland, Italy, Spain, and England, will be of interest to present-day travelers. Frequent reference is made in the letters to Lucien Scaife, then studying at Freiburg University, who accompanied his mother and sister on a portion of their travels, and later became a trustee of Carnegie Institute and Carnegie Institute of Technology, as well as an original trustee of the Carnegie Hero Fund Commission.

Lucien came round in the evening. He said, "It is such a pretty evening, the moon is nearly full, I think you would like to take a walk to Palais Royal." Well, we went, and walked and walked, for the further we went the finer the stores became. Some of the stores are lighted by electricity. We did not go in any of them, only looking in the windows. The most of the stores keep open till after twelve.

The Salon This year the Medal of Honor is given for the statue of *Music*. We did not like it as well as several others.

The next morning we got on top of one of the cars and went as far as it would take us in both directions. I tell you we saw a great deal of Paris for nine cents. This is the way Baedeker advises strangers to do, if they wish to know what Paris really looks like.

I think Napoleon himself (if he could see) would be pleased with his Mausoleum. The place was crowded with strangers. Opposite the entrance is an altar, on either side of it a large window with yellow stained glass, which lights up everythin'- like a golden sunset, making the surroundings gorgeous.

Last evening we went with Lucien to a scientific soiree at the Conservatoire des Arts et Metiers. A great many of the rooms were lighted by the electric light, which I think just like moonlight only stronger. Our eyes ached when we would come into the yellow gaslight, the other being so much softer. Inventors had brought their instruments and had them in working to show these men. One was of the telephone. Over five hundred persons were present, and so quiet when we were listening to the cornet through the telephone, that the dropping of a pencil could have been heard.

The fashions here are pretty much the same as at home, only you never see much dressing on the street, nor bright colors. Most of the bonnets fit close to the head and have little curtains. Sacques are to be long. Plaid dresses are going to be very much worn this winter and are very pretty. We do not expect to buy dresses or anything of that kind, and indeed none of you need expect anything of much value for it will take all for our traveling expenses.

This afternoon we went to the Gobelin Works and do not wonder they ask such a price after seeing how it is made, stitch by stitch.

PARIS, SEPTEMBER 1878

By evening it had cleared off, so when Lucien asked us to take a walk we had a delightful one. We went to the Place de la Concorde, and while standing there admiring the stars found a man with a telescope. This was too much for Mother, so we had a look at Saturn and his rings, then went on to the Gardens in the Champs Elysees which are lighted by electricity and are almost bright as day. You would think all creation had gathered here, for every nation and every tongue is represented.

In Cora's letter she asked how the hair is dressed. Well, to begin with, you never see a bang unless you meet an American girl. Then for the street and house it is either in a plat low on the neck and even with the top of the head, or in a coil or French twist with several puffs. I have crimped mine most of the time I have been here, for Mother kept at me, and then it is very easily done on the rubber pins.

It is well you are not here or you would not have had a tooth left by this time, for mine have all the sharp edges worn off eating their hard bread, though I like the taste of it very much.

We all took the eight forty-five train for Fontainebleau.

In the afternoon we went to the Louvre, and spent all our time looking at a few of the principal paintings. Every place where we have gone to see paintings we have found artists copying the best of them. A great many of the artists are quite old. The men in Paris are taught without charge, but the women have to pay, not for the privilege of painting in these places, for that is free to all, but for learning to draw and paint.

Three gentlemen had gone to an execution that morning to see how the guillotine worked. In order to be near the scaffold they stood from one till five o'clock to see the work of an instant. But isn't that just like Americans when they make up their minds to see anything.

We took the boat for Sevres and the forest of St. Cloud. In one of the prettiest parts of the grounds are swings, shows, shops of every description, restaurants, and a place where they make and bake the thinnest waffles I ever saw. Children in little wagons drawn by white goats, and such crowds of people that it was almost impossible to get along, but perfect order.

In the afternoon we went to see the relics in Notre Dame. Of course we had to wait our turn and then run after the leader like sheep. There were more than a hundred in our crowd, but we got close to the treasures and had a good view of them, especially the robes worn by Napoleon, Josephine, and all the ones who took part in the coronation ceremony. As these are Exposition days the real pieces of the crown of thorns and cross are exposed in glass cases for the faithful to kiss, for which they have to pay two cents more.

In yesterday's *Register* is a notice of Prof. Nichols' of Pittsburgh divorce, it having been granted on the grounds that he was deceived in her age by her wearing false hair,



"We reached the Arc de Triomphe, mounted the 261 steps, and were stepping out to have a fine view of Paris"

and using cosmetics, and that he had sued the *Dispatch* \$10,000 for publishing about his divorce suit. Is this true?

Mother says if you expect her to stay away any longer you will have to write oftener.

We received letters from Cooke, Marvin, Walter, and Cor, and each one contained the death of someone, as did the one Lennie Livingston received. Two of them from that terrible disease—cancer.

We all went to the Louvre to have another look at the antique sculpture. In one room are two statues by Michelangelo called *The Slaves*, and said to be among his best, but the *Venus of Milo* has a room to herself, as it is considered so much finer than any other of the statues, and though she is without arms and all pitted, she is still a beauty.

INTERLAKEN, OCTOBER 1878

We kept awake most of the night to be up early in the morning to see the sun rise, so by

the time the Alpine horn sounded we were dressed. Lucien had the man give us a room where we could see the sun rise from the windows and opposite the Jungfrau, Monk, and Eiger.

By nine o'clock the grass was dry, and the fog had lifted from the valley, so we could see the lakes and mountains for miles around. We found it so warm that we remained outdoors walking and gathering flowers till ten minutes of the time for starting. . . . Lucerne . . . Alpnach . . . the Brunig Pass . . . Lungen . . . Lake Brienz.

Here at Interlaken they have the whey and grape cure. The carved wood we don't think is worth what they ask for it. In the house is a music box as large as an upright piano and goes by turning a crank. It sounds like a full band.

I think we have enjoyed the butter and honey of Switzerland almost as well as the scenery.

GENEVA, OCTOBER 1878

On the train at Lausanne Gambetta and his party had a car attacked. He (Gambetta) has come to Geneva to rest after his speech-making through Paris. He is a very ugly man, with only one eye. The other eye he put out because his father made him go to school, and he told him if he sent him back he would put out the other one. We are in a hotel on the lake in a room facing Mont Blanc. . . . Calvin. . . . Rousseau.

ROME, NOVEMBER 1878

Yesterday was the anniversary of the dedication of St. Peter's, so we went to the church to hear the music and it certainly was grand. The chapel where the services were held was festooned, the altar covered with gold cloth, and the steps with velvet carpet. Dozens of candles burning round the altar, and in front of the altar on a gilt chair sat a cardinal dressed in lace, gold and silver cloth, on his hands white gloves embroidered with gold, and on his head a miter covered with precious stones. There were two organs and two choirs. Each choir had over thirty singers, so you can imagine what music we heard.

The cardinal and principal priests went into another chapel, and two of them began disrobing him till they had taken off five garments; and had come down to the red frock with white tunic, then put on a long red cloak and white ermine cape lined with red silk, red cap, took off his white satin shoes and stockings embroidered with gold, and put on his red shoes. He had on his long red stockings under his white ones. After all this dressing and undressing before the people (we were leaning on the rail opposite him) he took out his snuff box, took two good pinches, and after putting on his spectacles began to read in a book to himself.

Lucien has gone out to see if there is any further word from the King. He was expected

home tomorrow, but some think his arrival has been postponed for a few days. The Catholics attribute the flood and everything evil which has befallen Rome to the King, and say all these things have happened ever since the Pope has been made a prisoner by the government. Lucien is reading this evening's paper and says the people seem to think that the man who attempted the King's life had been hired by some society. The French papers say they think it was done by one of the Bonaparte's party which belongs to the Catholics.

ROME, DECEMBER 1878

Villa Ludovisi Borghese Palace. . . . Villa Dorei Pamfili.

This morning we all went to St. Peter's to hear the singing, for we were told it would be very fine as it is the anniversary of the Immaculate Conception. We did not like it as well as the time before that we were there, for the theatrical performance was not so fine, being conducted by an archbishop instead of the cardinal. All the principal chapels were decorated, and the virgin decked out in bracelets and crowns. A monk preached. Lucien says he was trying to show the people that they need not expect peace and prosperity until they all came back into the arms of the church. Lucien has conversed with several Italians and they are not pleased with this Pope, and say it is harder on their business since he does not show himself to the public, for not so many strangers come to Rome, and when they do come, leave sooner because St. Peter's does not have the fine procession it did some years ago.

Naples Vesuvius When we arrived, there were the three chairs, twelve carriers, and at least a half dozen guides. Then Lucien's trouble began, for although there is a fixed price for being carried, that does not include their fee. They all talk so loud and

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"The anniversary of St. Peter's, so we went to the church to hear the music and it certainly was grand"

make so many gestures one would expect them to come to blows every minute, yet we have not seen a fight in Italy. At last all was settled, we three women got into our chairs, were hoisted on the shoulders of four men before we could say Jack Robinson. I did not feel any higher up than when on horseback, and think the motion similar to riding a camel. Mother says she would give a dollar for one photograph of us going up the mountain. We had a fine view of Naples and the bay, but were more interested in the mountain. The lava makes it a dreary spot.

At Pompeii we went first to the Museum, where we saw eleven skeletons just as they were found. One woman had evidently thrown herself on the floor and covered her eyes with her arm. One man they think must have been sick, for the eyes were closed and he had a peaceful look. We saw the rooms where they were found, and also the room in

the house of the Faun where one skeleton was found with a bag of money in his hand. Forty pieces of gold were found on him. In the house of Diomedes were found beautiful gold bracelets, earrings and rings. At Naples we saw the frescoes which were taken from these houses, and some of them are very pretty. At the baker's is an excellent bake oven, and we saw the bread taken from it, the mill in which he ground his wheat is still standing; also wine shops in which the counters and wine jars are left. The houses of today are built on the same plan of those eighteen hundred years ago, even to the arrangement of the kitchen. The house of Glaucus is one of the largest, and there are still some pretty frescoes in it.

This morning we had Punch and Judy acted outside our windows, and now we are being serenaded by two good singers, one playing the guitar while he sings, the other a violin.



Hung by the Heels.

This new diagnostic X-ray machine makes it possible to hang a patient by the heels while a fluid that is opaque to X-rays is injected into her spine, and travels slowly down toward her head as the doctor fluoroscopes her spine in the search for a possible tumor. The support for the huge geared ring on which the X-ray table is mounted, as well as most of the sheet steel panels used on this unit, is made of USS Steel.



UNITED STATES STEEL

NICE, FEBRUARY 1879

There is something very exhilarating in the air; but the light is dazzling, not at all like our bright days at the seashore. It must be something about the light blue of the sky. Every afternoon nearly we go and sit down in the Park to hear the music (which is very fine), and to watch the people. It is much more interesting than to watch people at home, for here almost every nation is represented even to Turks, Chinese in full costume, and several Negroes. We hire chairs, two cents apiece, for the whole afternoon.

Monaca . . . Monte Carlo . . . The place is beautifully fitted up, and everything quiet except the jingle of money. There is a large hotel here, but at the end of a week if you have not played you are requested to leave. Lucien says you get a wrong idea of the use of money going to such a place.

We always leave the Park and walk or ride on the Promenade. Most of the men smoke, and will sit in the same car (if allowed by the ladies) or next you on the promenade or Park, and almost puff in your face, and no one considers it rudeness in them; but you never see them spit or use tobacco, all floors and pavements are free from this dirt. I don't believe there is any other country in the world where women receive as much attention as they do in America; and they had better give up talking about Women's Rights or they may get them as in these countries.

There are a great many fancy turnouts here, but we have most fun watching the ladies drive. Very few ever think of riding or driving anywhere but on the promenade, so in the course of an hour you see the same persons several times. The ladies, especially the titled ones, dress beautifully, as they go to be seen, and in one fourth of the carriages the dog has the seat of honor.

I don't know whether you folks have seen this in the paper about Gov. McCormick. He

was asked why he was in such a hurry to leave Paris, and said he was hungry and wanted to get back to America to get something to eat. Well, they do have the queerest dishes I ever heard of, and it does not make any difference how expensive a hotel you go to, it is the same. They never believe in having the same thing twice in a day, and in order to have enough courses and different dishes they cook all sorts of things, for no part of an animal goes to waste. Even rooster's combs are cooked and brought on the table, every part of a calf's head even to the eye, the worst looking sausages, and too many other things to mention. They live principally on meats, though they have more vegetables in the market during the winter than we have. We do enjoy the good bread and coffee, and get plenty of them; also plenty of fruit, so we have no cause to complain.

NICE, FEBRUARY 1879

Sunday afternoon we were walking along by the beach when all of a sudden we heard outlandish yelling, turned and saw two or three dozens of men masked and in different costumes. Some costumes were elegant, but the most were of paper muslin of various colors. One man jumped onto a carriage containing ladies, and began talking to them. This is the beginning of Carnival, and everything impudent is considered fair during these times. The whole thing seems very ridiculous to me, and a waste of money on so much nonsense. Tonight there is a large ball given for the benefit of the orphans of Nice. The dressing will be magnificent. Emily Shaumberg of Philadelphia is one of the greatest belles here.

BARCELONA, FEBRUARY 1879

Mardi Gras . . . A Spanish lady had a balcony near us, threw candy at her friends every day, and one had the greatest fun seeing the youngsters throw themselves on the

ground to get what fell outside of the carriages. Some of the dresses were elegant, and many representing different animals were very funny. We did not go to bed till nearly midnight, but the streets were filled with people till morning. The crowd was a very picturesque one, for the peasants dress in bright colors, and the women wear bright handkerchiefs on their heads and the men wear caps shaped like the cap of our Liberty, of different colors. With it all we did not see a drunken person nor a fight.

PARIS, APRIL 1879

Sunday afternoon we went to hear Père Hyacinth preach. Years ago he used to be at the Madeline, and was always the one selected to deliver the sermon Easter Sundays at Notre Dame. He calls his church the Gallican Catholic Church.

We can easily understand why Americans like to live in Paris. There is always so much going on, and everybody you see looks happy and contented. Now in Italy and Spain there were so many beggars and distressed looking people, but in Paris you never see anything of the kind, and we have visited the very poorest quarters.

Thursday morning was very cloudy, so we concluded to spend it at the Louvre, a good place to spend one's time, but especially on rainy days.

St. Roch's Church to see what they call the Entombment, which takes place every Good Friday. In the evening a kind of oratorio. Emma Thursby sang, and received an enthusiastic encore. She is over here studying, has improved very much, and in last week's paper it mentioned her, and asked why she does not come out in opera.

Today the ham and gingerbread fairs begin, but we have not yet been on the boulevards where they have the booths.

Sunday evening at six o'clock we went to

the Synagogue. The men all sit below with hats on, and the women above in the gallery. We found we had taken the Rothschilds' seats.

National Library. . . . After coffee we went to have a last look at the Luxembourg. There is a saddening feeling comes over one when bidding these scenes good-by.

In the evening we went to the new Opera House to hear the *King of Labore*. I never saw such scenery, and the dressing was elegant, especially in one scene where there were nearly two hundred of a chorus dressed in the costumes of the East Indies. It was one of the fashionable nights, so we had an opportunity of seeing how magnificently many of the French ladies dress.

Sorbonne. . . . Pantheon. . . . St. Chapelle Palace of Justice.

LONDON, APRIL 1879

London is so large, and the distance from one place to another so great that we nearly always have to ride but you can get a hansom or cab everywhere. The cab horses are the best we have seen anywhere, and go very fast. . . . Kensington Museum. . . . Hyde Park. . . . Hundreds come here every afternoon to walk, drive or ride, and there are a great many fine horses and turnouts. All yesterday we wandered about the different streets in the heart of the city, especially those mentioned by Dickens. No wonder he had so many strange characters, for the English are the most peculiar looking people we have seen in all our travels.

Windsor. . . . Albert Memorial. . . . much finer than the Medici Chapel at Florence. From the top of the tower we could see the church where Gray is buried, William Penn's house, where Milton lived and wrote most of his *Paradise Lost*, Eton College, and so on. While we were there the man told us

[Turn to page 275]



PERMANENT PAINTING GALLERIES RENOVATED

LEON ANTHONY ARKUS

For the first time since the inception of the Department of Fine Arts, the permanent collection of paintings at Carnegie Institute has been arranged with regard to school and chronological order. The Department has recently completed the redecoration and rehanging of the galleries, breaking the collection into three distinct sections, with wall colors indicating separation of periods.

Gallery A on the second floor now houses the "Old Master" section. The J. Willis Dalzell Memorial Collection, with its emphasis on the English Portrait School, has been removed from the Music Hall foyer and installed with the other paintings. The hang-

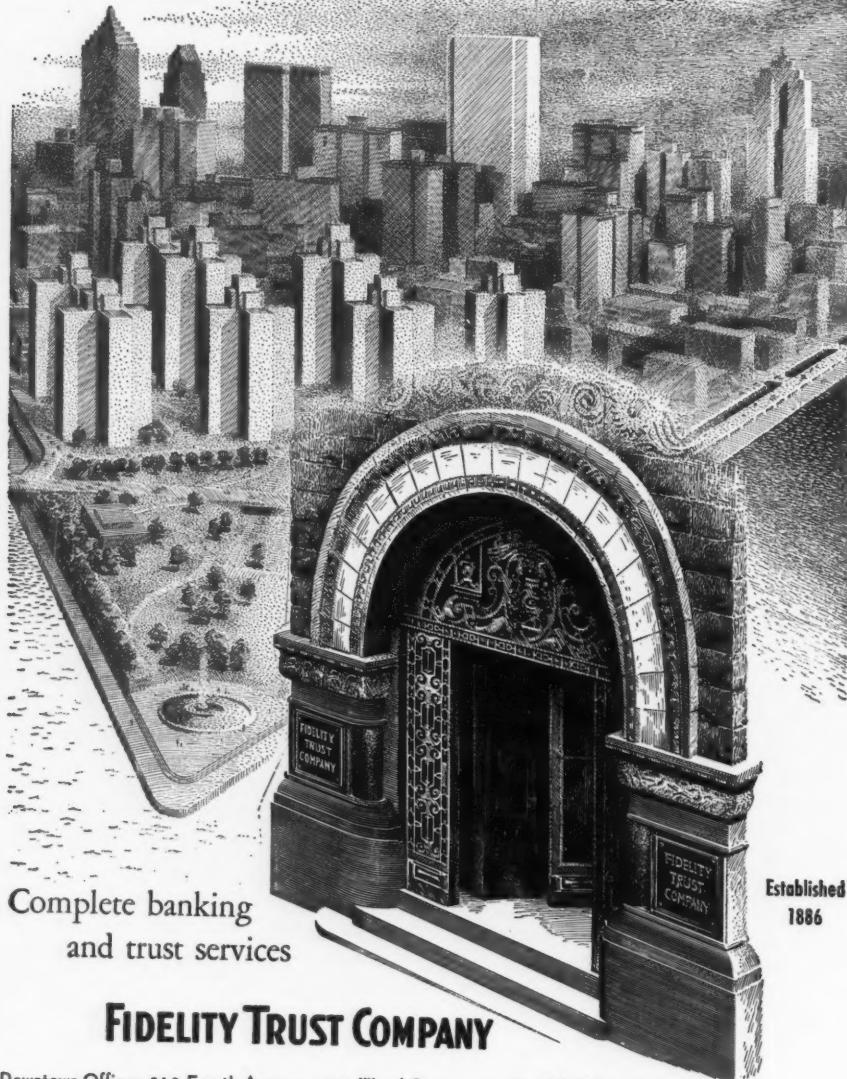
ing area of the gallery has been painted a Venetian red.

Gallery B contains paintings of the Modern European School. The color distinction is light blue. Gallery C has been enlarged by the removal of a storage area, and here the space is devoted to American art. The color in this gallery is a tempered yellow. The skylights in all rooms have been cleaned and the lighting redirected.

A very important collection of works, dating from the Middle Ages to the eighteenth century, has been given by Baroness Cassel van Doorn of New York City to the Department of Fine Arts on permanent loan. It numbers close to one hundred objects and includes a wealth of fine chests, cabinets and armoirs, lecterns, tables, chairs and benches made in France, Italy, England, and Holland. Noteworthy among the objects in metal are

Mr. Arkus, assistant director of the Department of Fine Arts at the Institute, has worked on the redecoration and rearrangement of the galleries for the permanent collection of paintings which he here discusses.

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two dated bronze mortars, 1477 and 1551, and a pair of fourteenth-century torchères. Among individual works of art are a bronze group by Adriaen de Vries and a large bronze representing a Naiad, which the late Wilhelm Bode assigned to a German atelier. Many of these objects have been temporarily placed through the galleries, and a definite arrangement will be made later. A second-century Roman marble sarcophagus will eventually be shown in the Sculpture Court. In addition to the above, the collection includes a canvas by Sir Henry Raeburn, R.A., representing Robert Colt of Auldhame, M.P. and his wife Lady Grace, daughter of Lord President Dundas of Armiston, which is now on view in Gallery A.

With the removal of the Dalzell Collection pictures from the Music Hall foyer, replacements have been made with paintings representing the taste in art at the turn of the century, when the Hall was constructed. The juxtaposition of canvases brings to our attention many old friends, who take on a new look when given a different setting.

GRAND TOUR

[Continued from page 272]

the Queen was going out to ride, so we hurried down. The Queen looked like any old lady dressed in deep black, and all the ladies with her wore black. She drives nothing but grey horses, the other horses for the use of the family, guests and attendants, are bay.

LONDON, MAY 1879

Bazaars . . . Temple Church . . . Oliver Goldsmith . . . London Bridge . . . Marlborough . . . St. James Palace . . . Buckingham Palace . . . Changing of the Guard . . . Coldstream Band . . . Horse Guards . . . National Gallery.

At Kensal Green Cemetery we came across

a tombstone with the names of Maria and Francis Scaife.

Well! This is the last letter I expect to write on this side of the water (on this trip). The other evening Mr. Little said the ocean seemed like a much larger body of water to cross from this side than it did when he left the other side. Mother said those were her feelings.

FROM DUNFERMLINE

A LETTER from Dunfermline, Scotland, the birthplace of Andrew Carnegie, has recently come to the editor of *CARNEGIE MAGAZINE*, signed by J. W. Ormiston, secretary of the board of trustees of The Carnegie Dunfermline and Hero Fund.

"We are delighted to have the *MAGAZINE* each month, and hope that you will keep this board on your mailing list. I read the *MAGAZINE* with interest, and it is thereafter placed in the waiting room of this office for use by the trustees and visitors. Everyone expresses appreciation of the excellent articles and the beautiful way in which the *MAGAZINE* is compiled.

"You will no doubt be quite glad to know that we were particularly interested in an article in your February issue, 'The Old Forbes Road.' Colonel Forbes was a former owner of Pittencrieff Park, which Mr. Carnegie handed over to this town in 1903.

"At the battle of Fort Duquesne, Dunfermline was further represented by Sir Arthur Halkett and his son. The father was a Provost of Dunfermline, and both lost their lives in the battle. Pitfirrane Estate, which was owned by the Halkett family, is on the outskirts of Dunfermline and was acquired just over two years ago by this body. The mansion house has been turned into a golf clubhouse and the fields surrounding it into a golf course." 19

The article referred to on "The Old Forbes Road" was written by the late David W. Rial.

COLOR CHANGE IN OIL PAINTINGS

ROBERT L. FELLER

DURING a recent meeting at a prominent art gallery in New York a collector asked the author to examine a painting by a young artist with whom he was acquainted. His remarks ran something like this: "The gallery purchased this picture before the war. Some of the colors in it, particularly areas of blue and purple, have now discolored so badly that I'm afraid the picture is lost. I believe the artist used to mix alizarin and certain other pigments together to obtain a favorite color. As I recall, such mixtures are not permanent." That afternoon the staff conservator and the author studied the painting. We found the principal difficulty was not that the pigments had altered, but that the surface varnish had failed in an uncommon manner. We therefore suggested that the old varnish be removed and that the picture be revarnished.

The collector's immediate concern about the pigments is a frequently encountered attitude. Color in paintings is, of course, largely due to the pigments. Yet one must not hastily conclude that, because there is an alteration in color, the pigments must have changed. Such faulty reasoning is more prevalent among painters and collectors of twentieth-century art than is warranted. This article will review several causes of color change that do not involve alteration of the pigments. For simplicity the remarks will be restricted to paintings in oil.

It must be admitted that certain pigments used in the past have not proved very durable. But the majority of them are well understood today, and a trained technician can determine if they have been used in a particular picture. In contrast to past history, the contemporary artist has at his command more than forty-

five tested and approved pigments, according to a list prepared by the National Bureau of Standards.¹ The facts concerning these pigments were established over ten years ago through the co-operative efforts of the Bureau of Standards, leading manufacturers, and interested authorities. Nevertheless, artists still occasionally raise questions concerning the durability of their present palette based on these pigments. In closing, the article will discuss several of the most frequently raised questions, such as the one mentioned concerning alizarin.

COLOR CHANGE OWING TO YELLOWING OF VARNISH AND VEHICLE

A paint consists of pigment and vehicle, and the surface of a painting is usually protected by a coat of picture varnish. Accordingly, light striking a picture often must pass through three components: protective varnish, vehicle, and pigment. It is the influence of the varnish and vehicle upon color to which attention must be directed.

Perhaps the most profound distortion of appearance in paintings is due to the discoloration of natural-resin varnishes. This change may take place gradually over several decades. Often its full extent cannot be appreciated unless one sees areas of the picture with old varnish side by side with areas from which it has been removed. Much has been

Dr. Feller is the National Gallery of Art fellow at Mellon Institute and is a member of the standing committee on artists' oil paints, Commercial Standard CS98-42. The fellowship, sponsored by the National Gallery of Art, Washington, D. C., is investigating the permanence of artists' materials to develop new materials and techniques, both for original works and for the conservation of museum objects.



DISCOLORATION DUE TO AGED VARNISH CONTRASTS WITH AREAS FROM WHICH IT HAS BEEN REMOVED

written on this subject; it need only be mentioned here. Fortunately old varnish generally can be removed. Moreover, perhaps this problem will become less important in the future, for new varnishes are being introduced, formulated with synthetic resins that have little tendency to yellow. Several museums in this country have over ten years' experience with varnishes of this type.

While discoloration due to varnish often can be repaired, possibly little can be done to rectify yellowing of the medium once it has occurred. This is an important cause of discoloration, but its role should not be overestimated. To demonstrate this point, take a very dark medium, perhaps a copal varnish, and grind pigment in it to make a pastelike paint. In spite of the intense discoloration of the vehicle, the color of the paint usually is reasonably satisfactory. The explanation for this is that the coating of vehicle about each particle of pigment is not sufficiently great to

alter the hue radically.

There are factors other than discoloration, such as the change in refractive index discussed below, or perhaps a separation of the vehicle toward the surface, which must be taken into consideration to account fully for the influence of the aged vehicle upon color. The relative importance of each factor is still open to question and can only be answered when more precise information is at hand. An important step would be the direct measurement of color in paintings. The National Gallery in London has recently described a Lovibond Tintometer adapted especially for this purpose.

The influence of yellowing of the vehicle upon color has been considered by A. P. Laurie in one of his well-known books.² He prepared a chart of pigments, summarizing the observations that reds are least affected, then follow yellows, greens, and blues in that order. The diagram on the next page illustrates this information more technically.³ The arrows indicate how blue, green, and red are "shifted" decreasingly in color when the reflected light must also pass through a yellow filter, "f." The filter, although hypothetical in this example, is similar to the characteristic color of saffron. The location of the slight alteration of the red color is determined by taking into account the fall in sensitivity of the eye (dotted line) in this region. Reflectance curves, such as those used in this diagram, and related data on artists' pigments are available to those interested.^{1,4}

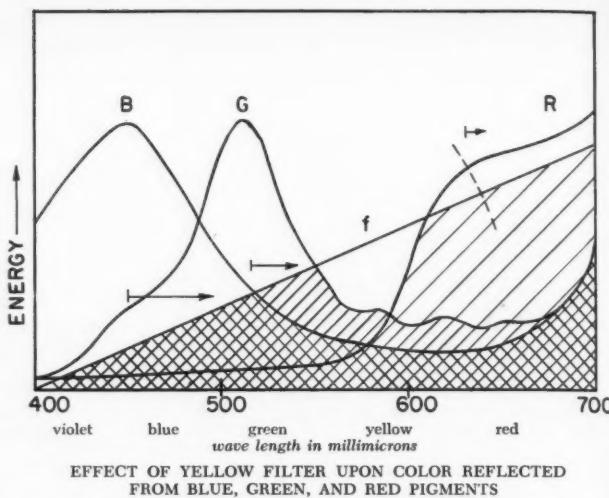
COLOR CHANGE OWING TO INCREASING REFRACTIVE INDEX OF OIL

The refractive index of a substance is the ratio of the velocity of light in a vacuum, or, what is very nearly the same, its velocity in air, to the velocity in the substance. The higher the refractive index, the more sharply light will be bent upon entering a medium

from one of low refractive index, and the more light that will be reflected at its surface, or at the "interface." What does this mean in practical experience? For example: if a colorless mineral is immersed in a liquid of the same index, light will travel at the same rate in the liquid and in the mineral. As a consequence, the ray will not be deflected at the surface of the mineral particle, and the particle cannot be seen! Powdered glass (refractive index, $N_D = 1.5$) is white in air ($N_D = 1.0$) because of the diffuse surface-reflection; but when immersed in water ($N_D = 1.3$) or benzene ($N_D = 1.5$) it can scarcely be detected.

That the refractive index of the medium exerts a marked effect on color may be demonstrated simply by placing a pigment in a series of vials containing water, petroleum ($N_D = 1.4$), turpentine ($N_D = 1.47$), and benzene. Generally the color will appear darker as the refractive index increases. This effect is largely responsible for the striking changes which occur when a pastel painting is heavily sprayed with fixative. In another familiar example, the index of refraction of alumina ($N_D = 1.5$ to 1.6), in lakes of alizarin and phthalocyanine colors, is nearly the same as that of oil ($N_D = 1.48$ to 1.50); these paints form transparent glazes, whereas paints of titanium dioxide ($N_D = 2.5$ to 2.6) and vermillion ($N_D = 2.8$ to 3.1) are opaque. The high index of titanium dioxide causes the pigment to reflect a considerable proportion of the incident light, making this white one of remarkable "covering power" and brilliance.

Linseed oil increases in refractive index with age. This is because the oxidation and con-



EFFECT OF YELLOW FILTER UPON COLOR REFLECTED FROM BLUE, GREEN, AND RED PIGMENTS

densation of the simple oils, leading to the formation of the tough linoxyn film, involves the gradual formation of a substance having a different index of refraction, as well as other "new" physical properties. Laurie⁵ investigated this change and reported that linseed oil varies from an index of 1.48, in fresh oil, to 1.60, in five- or six-hundred-year old objects. His studies of authenticated paintings showed a regular change with age. He even suggested that this phenomenon be used as a means of dating oil paintings. The lower refractive index in fresh oil may be compared to air in the example of powdered glass. As the refractive index of the oil increases, a paint more nearly approaches the example of powdered glass in water. Refractive index influences transparency in paints and, as a consequence, color.

The most dramatic occurrences of this change in oil paintings are the examples of "pentimenti," under-painting showing through in time. The de Hooch *Interior of a Dutch House* at the National Gallery, London, is a well-known case. In this three-hundred-year-old painting, the checkerboard pattern

in the floor is now disclosed through the lady's skirt. The artist evidently painted the figure over the floor pattern, thinking the pattern well covered up, but the paint has become more transparent in the passage of years. Colors, as well as shapes, may eventually show through in this manner. The fault, however, is not due to changes in the pigments.

The alteration of color owing to a change in the refractive index of the medium is inherent in vehicles that undergo extensive oxidation, or polymerization, as do our "drying oils." It is not a major phenomenon in beeswax or glue, for example. This problem, together with that of yellowing, has been discussed by Laurie in *The Painter's Methods and Materials*, chapter IX. The phenomenon receives most attention, however, in regard to pentimenti.

Should artists continue to use polymerizable mediums, with their advantage of becoming relatively insoluble in time, the alteration of refractive index might be speeded up by baking, as is done with modern industrial finishes. The forger, Van Meegeren, constructed an oven and used a modern resin in this manner, although for other reasons.⁶

COLOR CHANGE DUE TO SURFACE OF VARNISH OR UNEVEN CLEANING

If a varnish has a mat finish, the color beneath will not be as intense as it might be; it will be "hazy" because of the diffused surface-reflection. The varnish surface therefore influences the "total effect" of the picture. Similarly, uneven removal of discolored varnish will alter the appearance. This fact is very important in museums, where the appearance of the picture is controlled by the processes of conservation and cleaning, on those occasions when it is found necessary and advisable to treat the painting in the laboratory. There is on record, for example,

that old varnish lies over the gold ornaments and decorations in Velazquez's portrait of *Philip IV when Elderly*.⁷ In another case, Brandi⁸ mentions that the background of the *Pieta* of Sebastiano del Piombo was less prominent than originally intended because of a tinted "beverone" (wash) over the landscape. A connoisseur may comment on these affects without realizing that it is uneven cleaning (and not the pigments) which is at fault.

COLOR CHANGE OWING TO CHANGE IN ILLUMINATING LIGHT

The illuminating light, whether daylight, an incandescent lamp, or a fluorescent lamp, may alter considerably the color seen by an observer. The light from an incandescent lamp resembles the characteristic curve of filter "f" in the diagram. Compared to a north light, there is a deficiency in the shorter wave lengths. Little "blue" is present for the eye to see, even though pigments are present that reflect light of this wave length. Painters who paint under lamps at night are often quite impressed with this fact. Since pictures may be exhibited under different conditions of illumination, this factor should not be overlooked when criticizing "alterations of color."

COLOR CHANGE OWING TO CHEMICAL CHANGES IN THE PIGMENTS

Thus far the several changes discussed have not involved alteration of the pigments. While it is true that certain pigments of the past have changed, the factors mentioned must not be underestimated. If discoloration can be shown not to be due to the above causes, then one may test to see if pigments known to be fugitive are present. This can be done with considerable accuracy, but in the last analysis it necessitates technical examination by an expert.

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At present it is appropriate to restrict this discussion to the list of "permanent" pigments specified in the Bureau of Standards report.¹ Artists should have high confidence in this palette, and be grateful to the manufacturers and technical advisers who established these standards. The primary test of durability, or admissibility, to this list is based on light fastness during out-of-door exposure. Certain pigments that do not appear on this list may be just as permanent, but the artist should make a special point to check.

Other than fastness to light, of which there is little doubt, artists still speak occasionally of the incompatibility of certain pigments. By this is meant a chemical reaction between two pigments when mixed together. It is not widely known, but Gettens⁹ several years ago directed a special study of this very problem. The experiments involved white lead, sulfides, chromates, copper salts, and alizarin. Under severe conditions of light, humidity, and temperature, copper and chromate pigments reacted much as expected. These particular pigments are not in the Bureau of Standards list. In all other cases of suspected incompatibility, the linseed oil evidently protected the particles sufficiently to prevent chemical reaction.

The recommendation by Fischer,¹⁰ that alizarin not be mixed with earth pigments, was not found necessary as a result of these experiments. Fischer's suggestion was based on the fact that different earths are sometimes used to modify the shade of alizarin lakes during manufacture. He therefore recommended that alizarin not be mixed with certain earth pigments. He did not claim that such a mixture was known to be impermanent; he merely suggested that it might be safer not to mix these pigments. Several prominent manufacturers of artists supplies kindly informed the author, during the preparation of this

[Turn to page 285]

WQED

WATSON R. VAN STEENBURGH, art historian and newly appointed faculty member of the Henry Clay Frick Fine Arts Department of the University of Pittsburgh, with Elizabeth Rockwell Raphael, director of the former Outlines gallery, and Herbert P. Weissberger as moderator, will appear as a panel over Channel 13 Monday evening, October 18, at 8:30 o'clock, on "You—the Artist" series.

They will use paintings from the fall exhibit at the Institute, *GENRE PAINTING IN EUROPE, 1500-1900*, as a point of departure for the discussion. Both the human interest point of view and compositional approach will be considered.

FOREIGN POLICY DISCUSSIONS

SIX evening group discussions are planned by the Foreign Policy Association and Carnegie Library to meet in the Institute cafeteria at 8:00 p.m., alternate Wednesdays beginning October 6. Registration fee is \$3.00 per person or \$4.00 per couple. Reading material will be furnished, and a resource person from a local college faculty will attend. Telephone MAyflower 1-7300, Lending Department, ahead of time, since attendance must be limited.

HISTORY OF DOLLS

MORE than one hundred dolls illustrating the evolution of this favorite toy—and more than toy—through the ages are on display in the Museum-Library corridor this month. A copy of a Cro-Magnon figure (c. 20,000 b.c.) represents the oldest. All the dolls are from the collections of the Pittsburgh Doll Club and Carnegie Museum, which jointly present the exhibit. It will remain on display approximately six months.

ART AND NATURE BOOKSHELF

PERRY DAVIS

INDIA—PAINTINGS FROM THE AJANTA CAVES
UNESCO WORLD ART SERIES, VOL. I. 1954

TEXT BY MADANJEET SINGH

INTRODUCTION BY JAWAHARLAL NEHRU

New York Graphic Society, Greenwich, Connecticut

80 pages (\$15.00)

32 color plates, 3 black and white

Carnegie Library no. qr 729.4 U25

EVER since those earliest delegations were held in Venice in 1950, our newspapers have made us aware of the problems and proposals that confront UNESCO. Yet how many of us really understand the scope and variety of the projects that are planned? How many of us have seriously examined aims and intentions, or even know what UNESCO has accomplished in the wide field of the arts in the last few years?

By simply writing to the Columbia University Press in New York anyone can obtain information about UNESCO and select titles from the various pamphlets dealing with more particular phases of the arts or contemporary problems of cultural and educational interest.

One of UNESCO's largest programs in the arts is that of sponsoring the publication of great art books. The aim is to bring these books to as wide an audience as possible at a minimal cost. New translations of the world's greatest masterpieces in literature have been commissioned, as well as many of the Eastern or Near-Eastern works which have never been translated before. Magnificent editions have also been published of albums dealing with the plastic arts. Two of the earliest

Perry Davis divides his time between painting "on his own" and teaching in the painting and design department at Carnegie Institute of Technology, where he is an assistant professor.

volumes dealing with the paintings of Masaccio and Raphael are already collector's items.

The most recent publications in the new World Art Series are three volumes devoted to a singularly outstanding art from each of three representative countries. From India we have the Ajanta frescoes, from Egypt the paintings from the tombs and temples, and from Australia the aboriginal rock paintings. Printed in Italy, each volume measures over 13 inches by 19 inches and is handsomely designed and bound.

I have in front of me the album of the Ajanta frescoes, which is the first in the series. Although some earlier attempts have been made to photograph and reproduce these great wall-paintings in color, they were never so successfully done or so extensively treated. Thus, in the western world, our knowledge of this great tradition rested entirely on one or two photographs.

It is not from the point of view of the artist or scholar alone that I would say this volume satisfies a long unfulfilled need. In his preface to the book, Jawaharlal Nehru goes to the heart of the matter:

"Anyone who would understand the past of India must look at these frescoes which have exercised such a powerful influence not only in India but in distant countries also. If I were asked to name three or four places of paramount interest in India which give some glimpse into India's mind in successive ages, I would mention Ajanta as one of them."

The Ajanta caves were rediscovered in 1817 by some British soldiers on maneuvers in the rugged, wooded regions of western India inland from Bombay. Almost by accident this group of soldiers found a steep ravine formed

by the source of the Waghora River in the state of Hyderabad. Now this river drops over a bluff 70 to 80 feet high in a series of seven waterfalls, and it was at the bottom of this ravine that the soldiers found the long forgotten shrines and temples of Ajanta.

Madanjeet Singh has not only given us a text of remarkable authority, but he is also responsible for all the photographs in this volume with one exception. He has provided us with a set of additional black and white photographs of the surroundings and architectural settings.

Mr. Singh further explains the basic plan of this series of halls of worship or Chaityas, and monastic living quarters or Viharas, for the total scheme encompasses 29 caves in all. One of the large assembly halls has a barrel-shaped roof supported by 39 decorative pillars. This hall, we are told, is 95 feet in length, 41 feet in width, and 36 feet in height, thus we are able to visualize the scale of the room in relation to its paintings. It becomes all the more impressive when we consider the task it must have been to hollow this space out of solid rock.

The architecture follows closely the style of wooden buildings of that time, for the Ajanta caves have been dated back to the second century B.C. and up through the end of the sixth century A.D. Nevertheless those early Indian artists, who so patiently and laboriously chiselled the steep, precipitous crust of the rocks, demonstrated also such a wonderful respect for their new-found media that it satisfies even our most contemporary taste. The richness and depth of the carving found in the decoration of those immense stone pillars seem to complement the paintings so well simply because it points up the essential differences inherent in each media.

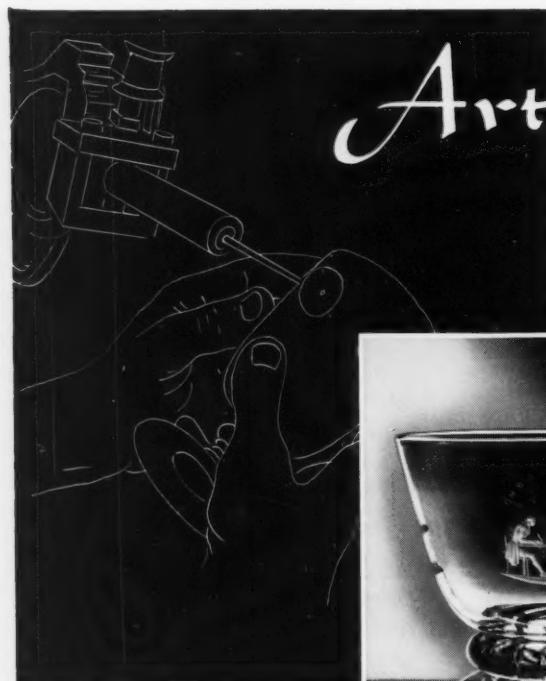
Perhaps the one thing which may be at first difficult for the Western mind to reconcile to his own ideas of a place of worship

is the earthly themes depicted in the murals which are so utterly gorgeous. If given some time, however, I believe the paintings themselves have that marvelous quality of transporting us to an entirely new esthetic plane. Once we have come to accept them for their remarkable insight into humanity, we also begin to appreciate the idea that their deeper feelings of religious piety is a truly all-pervading thing.

Mr. Singh has traced for us both the religious and historical background with great clarity. Not only does he mention the alternating religious climates in India, but shows us how this great tradition of art in India affected and influenced the arts in China beginning with the T'ang dynasty and spreading out with the history of Buddhism to Indochina, Indonesia, Malaya, Korea, and Japan. He tells us that the paintings of Ajanta were already a highly developed and influential art long before the ascent of the Gupta dynasties in India which ushered in the Golden Age or Hindu Renaissance. Certainly these paintings do have for Asia and the Asian art "the same outstanding significance that Italian frescoes have for Europe and the history of European art."

The Ajanta frescoes are narrative in character, dealing mainly with the Jataka stories, the legends of Buddha's reincarnations. Mr. Singh again reminds us, "The multitude of variegated Jataka scenes, of life on earth, of love and of pomp and pleasures of the kings' courts, merely from the external settings of the great beings, the Buddhas and Bodhisattvas, who, in their graceful bodies and significant attitudes, epitomize wisdom and understanding."

Although after centuries of neglect and even after the Buddhist monks began their recent excavations, time has left its fine veil of patina on these walls. This particular quality has been faithfully captured in the



Art for the table



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The base of the Ballad Bowl is magnificent. Heavy, yet sparkling clear, it is decorated with trapped air bubbles elongated to form a repetitive, ornamental pattern.

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new reproductions and in some instances almost enhances the painted surface, for some things do accept age most gracefully. I am sure there are many who might wish to contest my point of view, but I believe certain evidences of advancing age can be detected in the carved-rock walls and pillars too. All this only serves to point up the essentially organic character of the whole place, and much of its sheer beauty lies in the eternal contest between Man and the forces of Nature.

Yet we can still see through all of this today those astonishing and glorious colors: earth reds, browns, greens and yellows, lamp black, and accents of intense greens, crimsons, and lapis lazuli. The technique adopted in the preparation of surface was a base layer of clay mixed with rice husk and gum, upon which a coat of lime was applied to achieve smoothness. As Mr. Singh has pointed out: "It is a remarkable instance of how great works of art have been created by simple means."

COLOR CHANGE

[Continued from page 281]

article, that they had not in their experience found modern alizarin to be incompatible. Testing this possibility under accelerated-aging conditions is not easy, however. Nevertheless, such tests lead to the conclusion that oil paints containing copper and chromate pigments represent the principal cases where instability can be demonstrated.

In conclusion, it must be emphasized that one must not be hasty to attribute color change to fugitive or incompatible pigments. This statement is particularly true regarding the oil paints listed in CS98-42.¹ An artist reading literature concerning durability must

carefully consider the date of the publication of information referred to. Writers occasionally quote Doerner, Toch, and others on matters concerning which there are more modern data. There is still much to learn about the behavior of pigments; nevertheless, present manufacturers are able to supply the artist with more carefully prepared colors than were available in years past. They also are able to base their judgment on technical publications and special reports such as Commercial Standard CS98-42 and the work of Gettens and Sterner, data not widely known to artists. The author wishes to call particular attention to these two publications and to the fundamental phenomenon of the change in the refractive index of oil.

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